

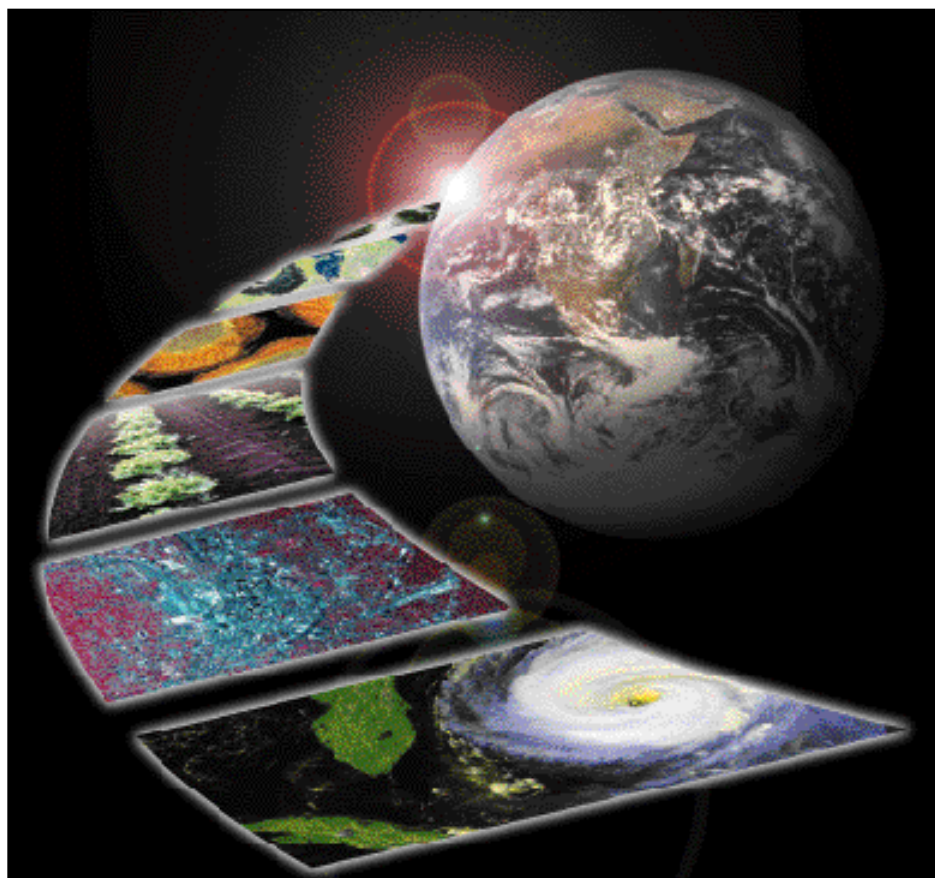


Contents:

1 Introduction.....	2
2 Earth Science Enterprise's Improved Remote Sensing Data.....	4
3 Agricultural Applications	6
4 Forestry Applications	12
5 Fisheries Applications.....	16
6 Insurance/Disaster Management Applications.....	20
7 Transportation Applications.....	24
8 The Role of Value-Added Providers.....	28

APPENDICES

A Contributors and Acknowledgments.....	29
B NASA Earth Science Enterprise and Related Web Sites.....	30
C Selected References.....	31
D Acronyms	36



Introduction

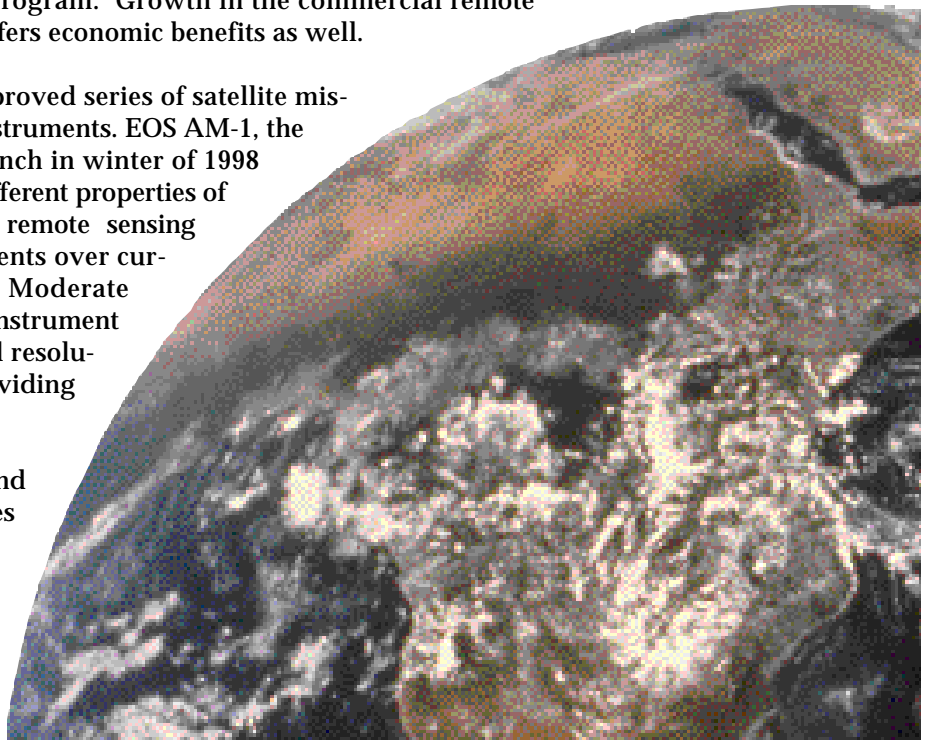


ASA's involvement in Earth system science began in the early 1980s in response to a growing awareness of human-induced changes to the Earth's climate system. Evidence of human impact on the environment included data showing rising levels of carbon dioxide in the atmosphere, and a correlation of this rise with fossil-fuel emissions. Also evident was the correlation of ozone depletion with the use of chlorofluorocarbons. When considered with human population growth estimates, these data caused widespread concern among scientists over both the short- and long-term consequences of human-induced environmental change.

Advancements in climate modeling techniques and the growing body of meteorological and paleoclimate data records led to new scientific research into predicting how these and other environmental changes will affect the Earth's climate system. Many federal agency and university scientists envisioned an integrated program of Earth system science with a major role in satellite remote sensing of the Earth. This vision became what is now the Earth Science Enterprise (ESE) program, whose goal is to expand our knowledge and understanding of the Earth system and global climate change. Originally called Mission to Planet Earth, the ESE program is NASA's major contribution to the U.S. Global Change Research Program (USGCRP). Today ESE contains two major elements: (1) the Earth Observing System (EOS), comprising a science research program, a constellation of earth observing satellites, and the EOS Data and Information System (EOSDIS); and (2) a smaller element that includes science and technology programs, Earth probes, and focused missions. The USGCRP provides a framework for Earth system science research by NASA, the National Oceanic and Atmospheric Administration (NOAA), the United States Geological Survey (USGS), the Department of Defense (DoD), the Environmental Protection Agency (EPA), and other federal agencies. First conceived by the Reagan Administration, ESE was initiated by President Bush in fiscal 1991, and continues to be supported by the Clinton Administration. All three administrations and Congress recognized the social and economic importance of the global environmental issues encompassed by the program. Growth in the commercial remote sensing market indicates that the program offers economic benefits as well.

In 1997, ESE began launching a new and improved series of satellite missions carrying several new remote sensing instruments. EOS AM-1, the first large EOS satellite, is scheduled for launch in winter of 1998 and will carry five instruments to measure different properties of the Earth's surface. These next-generation remote sensing instruments represent significant improvements over currently operating systems. For example, the Moderate Resolution Imaging Spectrometer (MODIS) instrument will provide data with much greater spectral resolution than currently available, as well as providing coverage of the entire globe every 2 days.

In addition to building new spacecraft and remote sensing instruments, ESE distinguishes itself from other NASA programs by focusing on interdisciplinary science. This interdisciplinary focus will improve our understanding of the complex interplay among ocean, atmosphere, and land. To understand the true nature of environmental and climate change, chemical, biological, and



geologic systems require coordination of research projects in different scientific fields. NASA illustrates commitment to this research through specific funding of interdisciplinary scientific research and data management practices, which allow users from a variety of scientific disciplines to use the data.

The ESE program promises to generate many new practical and commercial applications of remote sensing data. Several NASA-funded interdisciplinary research teams are investigating problems related to agriculture, fisheries, and other industrial sectors. In addition, NASA has long funded efforts to enhance commercialization of NASA-developed technologies under its Earth Observations Commercial Applications Program (EOCAP). The new data that will be generated by ESE satellites have a variety of potential commercial applications that may eventually spawn many new products, services, and industries. This brochure describes potential applications of ESE data to agriculture, forestry, fisheries, insurance/disaster management, and transportation industries.

